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First record of the genus *Falconina* (Araneae, Corinnidae) from Mexico, with a description of a new species and observations on its interactions with ants

Guillermo Ibarra-Núñez[1], Linda Marín[2]

1 *El Colegio de la Frontera, Sur. Carretera Antiguo Aeropuerto km 2.5, Tapachula, Chiapas, C: P. 30700, Mexico*

2 *Instituto de Investigaciones Forestales, Universidad Veracruzana, Parque El Haya, Carretera Antigua a Coatepec, Xalapa, Veracruz, C. P 91070, Mexico*

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Corresponding authors: Linda Marín (lemarinsky@gmail.com); Guillermo Ibarra-Núñez (gibarra@ecosur.mx)

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Abstract

Falconina cafetera **sp. nov.** (Araneae, Corinnidae) is described based on specimens of both sexes. Specimens were collected in shaded coffee agro-ecosystems and in a suburban cacao orchard in Chiapas, Mexico. This new species is the first *Falconina* recorded from Mexico and the northernmost species of the genus in continental America, with the exception of *F. gracilis* (Keyserling, 1891) introduced to the USA and Cuba. *F. cafetera* **sp. nov.** differs from all other *Falconina* species by having most of its opisthosoma light-colored with some dark patches and by the characteristics of the male palp and female epigynum. Observations are included about one sclerite found in the male palp of this species, not mentioned for other species in this genus. The key of *Falconina* species by García and Bonaldo (2023) is modified to include this species. Furthermore, field observations and laboratory rearing of juveniles indicate that *F. cafetera* **sp. nov.** spiders are able to feed on ants.

Key Words

Coffee agroecosystems, Chiapas, North America, male palpal structure

Introduction

The taxonomic history of the genus *Falconina* Brignoli, 1985 (Corinnidae) has been summarized by García and Bonaldo (2023) in a review of this genus. Currently, *Falconina* includes 10 species: nine from South America and one from Central America (World Spider Catalog 2024). It should be noted that *F. gracilis* (Keyserling, 1891), originally recorded from South America, has recently been introduced into the United States of America (Valle et al. 2013; Ubick and Richman 2017) and Cuba (García and Bonaldo 2023). Here we describe *Falconina cafetera* sp. nov., the first species of this genus recorded from Mexico. We include observations on its palpal morphology, including the origin of one bulbar sclerite, not mentioned previously for other species in this genus, and present observations on interactions of this species with ants. Moreover, we propose a modification to the key of *Falconina* species by García and Bonaldo (2023) to include *F. cafetera* sp. nov.

Methods

The examined specimens are deposited in the following institutions (acronyms and curators in parenthesis): American Museum of Natural History, New York, USA (AMNH, L. Prendini); Colección Nacional de Arácnidos, Instituto de Biología, UNAM, México (CNAN, E. González-Santillán); Colección de Arácnidos del Sureste de México, El Colegio de la Frontera Sur (ECOSUR), Tapachula, Chiapas, México (ECOTAAR, G. Ibarra-Núñez); Museum of Comparative Zoology, Cambridge,

MA., USA (MCZ, G. Giribet). Specimens were measured and photographed with an Olympus SZX16 microscope provided with an ocular reticle and a Sony SLT-A58 digital camera. All measurements are in millimeters (mm). Leg measurements are noted as total length (femur, patella, tibia, metatarsus, and tarsus). Images from multiple focal planes were assembled with ZERENE STACKER (version 1.04) image stacking software. Drawings were made with INKSCAPE (version 1.3) drawing software. Color descriptions are for live specimens, with notes on color changes in ethanol. Male palp was expanded in KOH 10% for 15 minutes, then transferred to distilled water, and after expansion, returned to ethanol 80%. Female genitalia were dissected and cleaned with a solution made with an eye lens cleaner (half a tablet of AMO Ultrazyme with Subtilisin A, diluted in 1 ml of distilled water) and cleared with methyl salicylate. Spination follows Petrunkevitch (1925). The format of descriptions follows García and Bonaldo (2023) with modifications.

Abbreviations

Female structures*: AEP**, anterior epigynal plate; **CD**, copulatory duct; **CO**, copulatory opening; **ExPVP**, extension of posterior vulvar plate; **FD**, fertilization duct; **PmEP**, posterior margin of the epigynal plate; **PVP**, posterior vulvar plate; **S1**, primary spermatheca; **S2**, secondary spermatheca. ***Male structures, **AS**, apical spur of RTA; **C**, conductor; **Cb**, cymbium; **CRP**, cymbial retrolateral basal process; **E**, embolus; **EB**, embolar base; **H**, hematodocha; **ML**, median lobe of RTA; **Pe**, petiole; **PTA**, prolateral tibial apophysis; **RPE**, retrolateral process of embolar base; **RTA**, retrolateral tibial apophysis; **Sp**, spermophore; **ST**, subtegulum; **T**, tegulum; **TP**, tegular process; **TPlss**, less sclerotized stripe on tegular process; **VL**, ventral lobe of RTA; **VPE**, ventral process of embolar base.

Results

Taxonomy

Family Corinnidae Karsch, 1880
Genus *Falconina* Brignoli, 1985

***Falconina cafetera* sp. nov.**

https://zoobank.org/D7235B0F-5DD5-46A8-8873-BF1910BABA9F

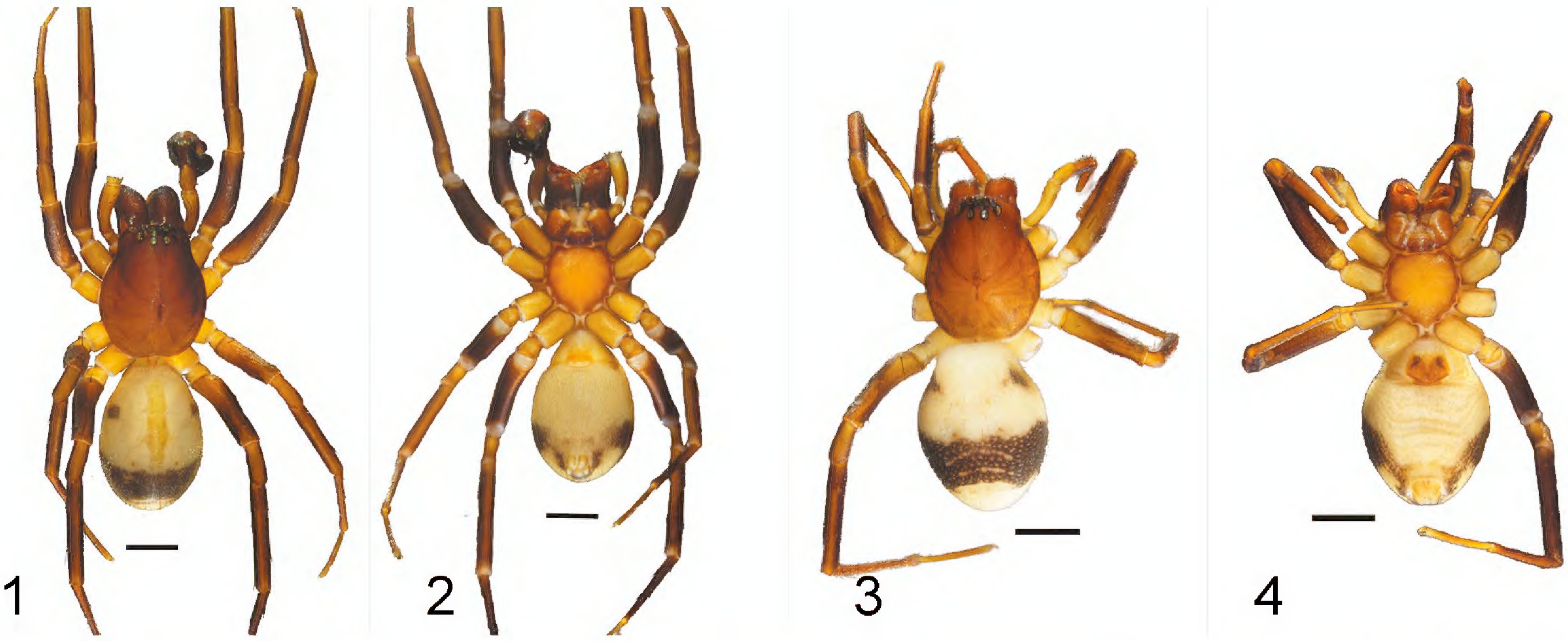
Figs 1–23

Type material. Mexico • 1 ♂ ***holotype***; Chiapas, Municipio de Tapachula, Finca Santa Anita; 15.1579°N, 92.3438°W; 980 m a.s.l.; 24 Oct. 2012; L. Marín leg.; in soil of coffee orchard, kept alive, became adult 7 Dec. 2012 (ECOTAAR-011484).

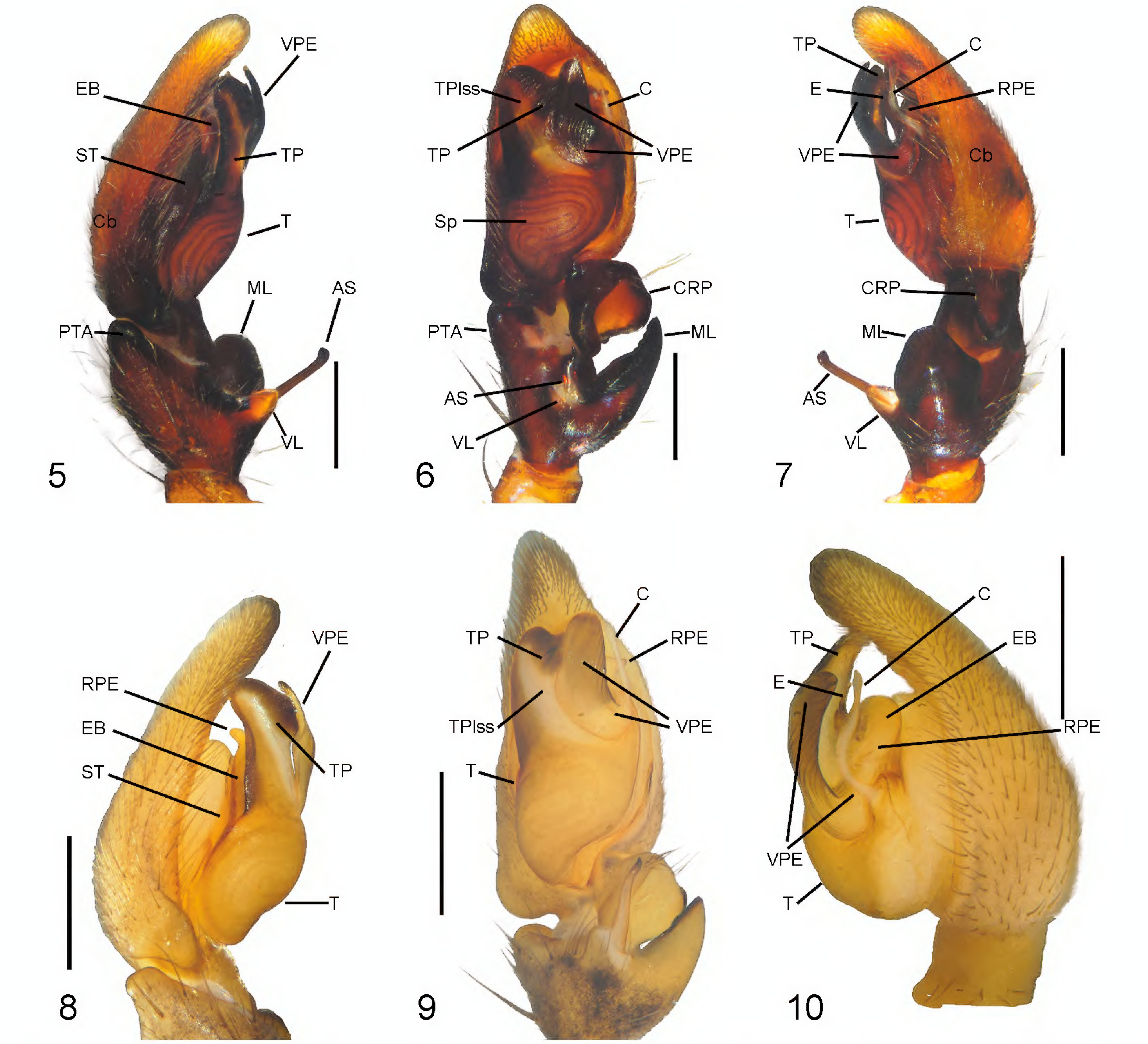
Paratypes. Mexico • 1 ♀ (***allotype***); Chiapas, Municipio de Tapachula, Finca Irlanda; 15.1697°N, 92.3400°W; 1070 m a.s.l.; 20 Jul. 2012; L. Marín leg.; in soil of coffee orchard (ECOTAAR-011485) • 1 ♂; same data as for holotype; became adult 10 Dec. 2012 (CNAN) • 1 ♂; same data as for holotype; became adult 11 Dec. 2012 (MCZ) • 1 ♂; same data as for holotype; became adult 12 Dec. 2012 (AMNH) • 1 ♂; same data as for holotype; became adult 14 Dec. 2012 (ECOTAAR-11489) • 1 ♀; same data as for holotype; 15.1554°N, 92.3403°W; 830 m a.s.l.; 31 Jul. 2011; (CNAN) • 1 ♀; same data as for preceding; (ECOTAAR-11491) • 1 ♂; same data as for allotype; (ECOTAAR-11492) • 1 ♂; Chiapas, Municipio de Tapachula, Camino a Raymundo Enríquez; 14.8738°N, 92.3096°W; 100 m a.s.l.; 15 Oct. 2015; E. Chamé-Vázquez leg.; in suburban cacao orchard (ECOTAAR-011498).

Etymology. The specific name is an arbitrary combination of letters derived from the Spanish word for coffee plantation, "finca cafetalera," where this species was first collected.

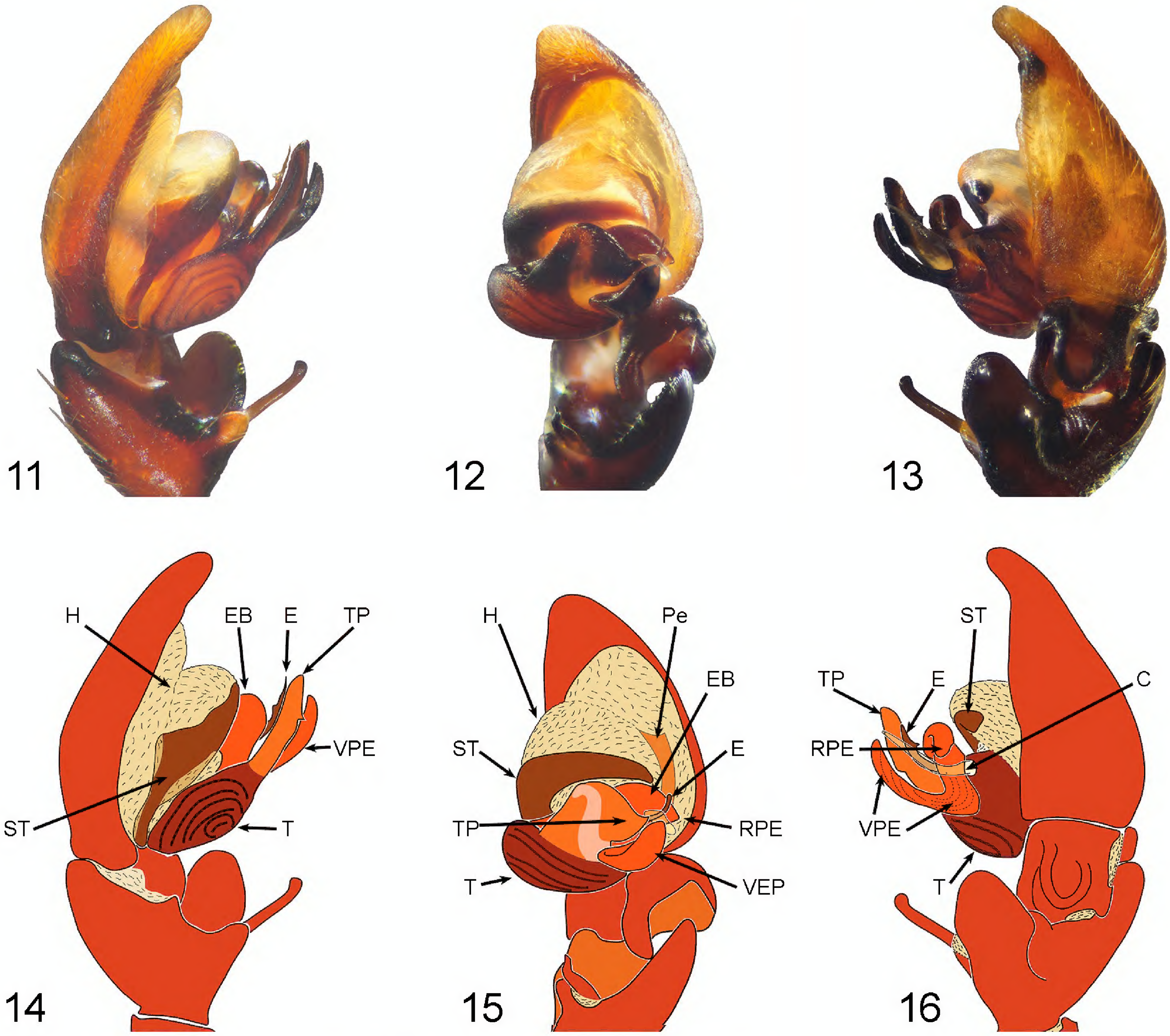
Differential diagnosis. Males and females differ from all other species by having most of their opisthosoma light in color with some dark patches (Figs 1–4, 21), while in all other species it is mostly dark with some light patches. Males of *Falconina cafetera* sp. nov. are similar to *F. albomaculosa* by sharing a long apical spur, by having only two lobes (ventral and median) on the retrolateral tibial apophysis, and by having a lighter, less sclerotized, longitudinal stripe (TPlss) on the sclerotized tegular process (Figs 5–16; figs 13A, 14A in García and Bonaldo 2023). Males of *F. cafetera* sp. nov. differ from *F. albomaculosa* by having a prominent prolateral tibial apophysis (small in *F. albomaculosa*), a relatively longer tibia, with the length of the prolateral margin of the tibia (including PTA) about two thirds the cymbium length on its prolateral margin (about half the cymbium length in *F. albomaculosa*), a massive cymbial retrolateral basal process (smaller in *F. albomaculosa*) (Fig. 6; fig. 13A in García and Bonaldo 2023); the apical spur slender (thicker in *F. albomaculosa*); and the median lobe of the RTA subtriangular (squared in *F. albomaculosa*) (Fig. 7; fig. 13B in García and Bonaldo 2023). The epigynum of *F. cafetera* sp. nov. females is similar to that of *F. albomaculosa* in having the posterior margin of the anterior epigynal plate procurved and close to the posterior margin of epigynum, PVP slightly projected posteriorly (Fig. 17; fig. 14C in García and Bonaldo 2023), and dorsally by having copulatory ducts in heavily sclerotized, wide chambers (Fig. 18; fig. 14D in García and Bonaldo 2023); *F. cafetera* sp. nov. females differ from *F. albomaculosa* in having the posterior margin of the anterior epigynal plate with a shallow notch (notch pronounced in *F. albomaculosa*), the posterior margin of the posterior vulvar plate almost straight (procurved in *F. albomaculosa*) (Fig. 17; fig. 14C in García and Bonaldo 2023), in dorsal view the posterior vulvar plate wider than long (about as wide as long in *F. albomaculosa*), with its anterior margin straight (procurved in *F. albomaculosa*), primary spermathecae separated by about four times their own diameter (separated by less than three diameters in *F. albomaculosa*), and by having secondary spermathecae inserted anteriorly in relation to primary spermathecae (secondary spermathecae inserted medially in *F. albomaculosa*) (Fig. 18; fig. 14D in García and Bonaldo 2023).



Figures 1–4. Habitus of *Falconina cafetera* sp. nov. **1, 2.** male; **3, 4.** female; **1, 3.** dorsal view; **2, 4.** ventral view. Scale bars: 1 mm (**1–4**).

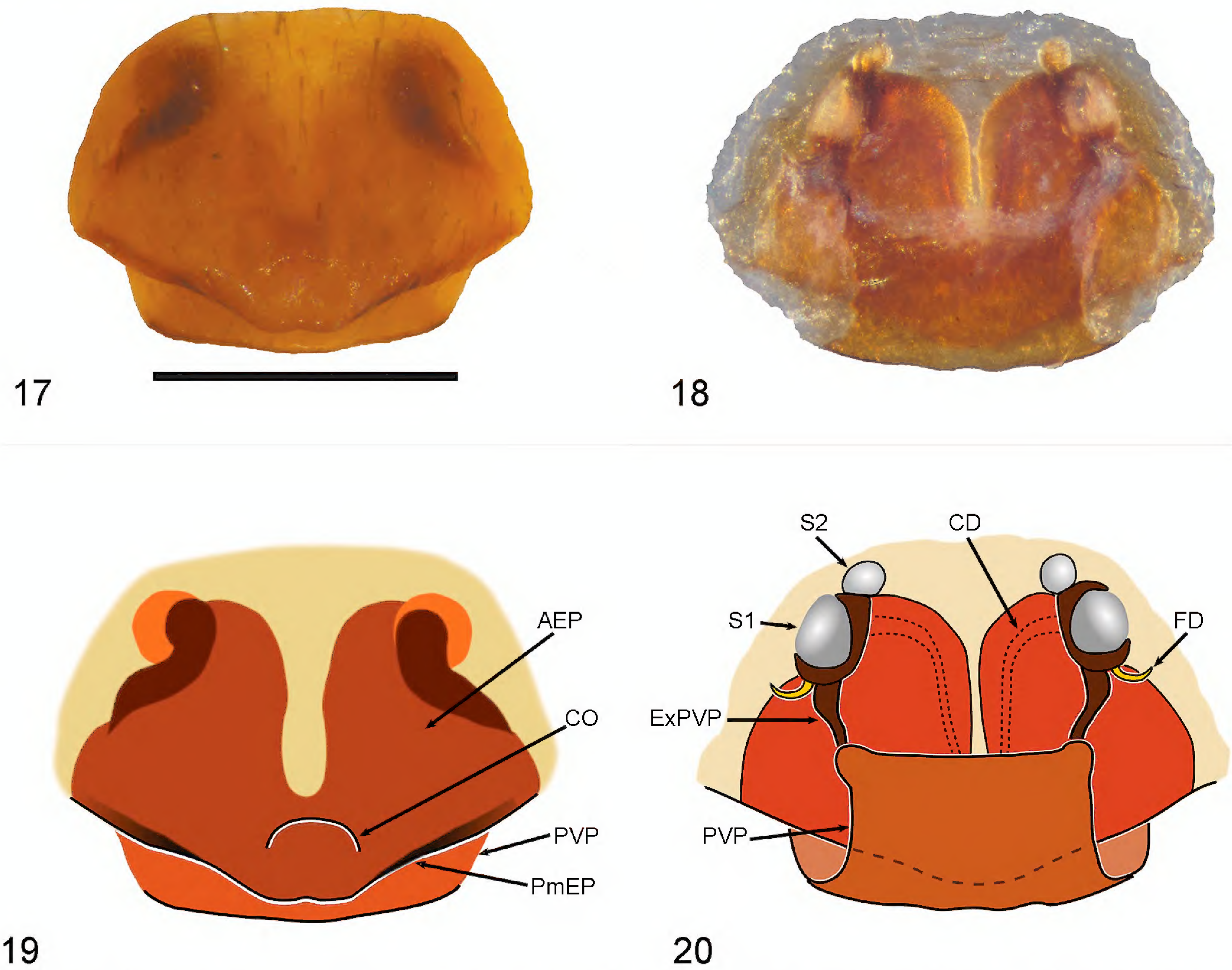


Figures 5–10. Male palp of *Falconina cafetera* sp. nov. **5–7.** Field-collected specimen (ECOTAAR-011492); **8–10.** Laboratory-reared specimen recently molted (ECOTAAR-011489); **5, 8**. Prolateral view; **6, 9.** Ventral view; **7, 10.** Retrolateral view; **AS**—apical spur of RTA; **C**—conductor; **Cb**—cymbium; **CRP**—cymbial retrolateral basal process; **E**—embolus; **EB**—embolar base; **ML**—median lobe of RTA; **PTA**—prolateral tibial apophysis; **RPE**—retrolateral process of embolar base; **Sp**—spermophore; **ST**—subtegulum; **T**—tegulum; **TP**—tegular process; **VL**—ventral lobe of RTA; **VPE**—ventral process of embolar base. Scale bars: 0.5 mm (**5–10**).



Figures 11–16. Expanded male palp of *Falconina cafetera* sp. nov. **11–13**. Field-collected specimen (ECOTAAR-011492); **14–16.** Drawings based on figures **11–13**; **11, 14.** Prolateral view; **12, 15.** Ventral view; **13, 16.** Retrolateral view; **C**—conductor; **E**—embolus; **EB**—embolar base; **H**—hematodocha; **Pe**—petiole; **RPE**—retrolateral process of embolar base; **ST**—subtegulum; **T**—tegulum; **TP**—tegular process; **VPE**—ventral process of embolar base.

Description. Male (holotype). ***Color pattern and habitus.*** Carapace dark brown, pars thoracica lighter, eyes surrounded by narrow black rings; chelicerae dark brown, labium and endites brown, distal margins of endites white; sternum light brown with brown margin; palpal trochanter to patella light brown, tibia dark brown, cymbium brown; legs: coxa, trochanter yellowish brown, femur to metatarsus dark brown, with dorsal lighter patches, tarsus light brown; opisthosoma orange (light yellow in ethanol), with two small oval black patches at the sides of anterior half, a thick, transversal black band at posterior half, with a thin, transverse orange (light-yellow in ethanol) line near its posterior margin, the thick black band continues to the sides, narrowing, posteriorly directed, surrounding the spinnerets, dorsum with an orange (yellow in ethanol), narrow, coriaceous dorsal scutum on the anterior two thirds (Figs 1–2, 21). Carapace mostly glabrous, with very short, sparse, translucid setae, with a few sparse long setae on the ocular area; fovea longitudinal; chelicera geniculate, with prominent cheliceral boss, anterior face with abundant small tubercles supporting small erect setae and a few sparse long setae, promargin of cheliceral furrow with rows of long bristles, with three teeth (second tooth largest), retromargin with four teeth; sternum with scattered small tubercles and a few long, scattered setae. Dorsum of opisthosoma covered with abundant, small, translucid setae, darker over and around the black patches, with scattered long setae, venter with abundant, small, gray setae (Figs 1–2). Metatarsi III–IV with dense preening brush. ***Measurements.*** Total length 5.94; carapace length 2.81, width 2.25, sternum length 1.45, width 1.40; opisthosoma length 3.05, width 2.16. Anterior, posterior eye rows procurved; anterior median eyes largest, separated by a little less their diameter; anterior eye row width 0.76, posterior eye row width 0.90; median ocular quadrangle length 0.40, anterior width



Figures 17–20. Female epigynum of *Falconina cafetera* sp. nov. **17–18.** Field-collected specimen (ECOTAAR-011491); **19–20.** Drawings based on figures **17–18**; **17, 19.** Ventral view; **18, 20.** Dorsal view (cleared); **AEP**—anterior epigynal plate; **CD**—copulatory duct; **CO**—copulatory opening; **ExPVP**—extension of posterior vulvar plate; **FD**—fertilization duct; **PmEP**—posterior margin of the epigynal plate; **PVP**—posterior vulvar plate; **S1**—primary spermatheca; **S2**—secondary spermatheca. Scale bar: 0.5 mm (**17**).

0.46, posterior width 0.44; clypeus height 0.28. ***Legs measurements.*** I total 9.04 (femur 2.40/ patella 1.00/ tibia 2.20/ metatarsus 1.84/ tarsus 1.60); II 8.04 (2.32/ 0.92/ 1.84/ 1.76/ 1.20); III 7.57 (2.06/ 0.76/ 1.55/ 1.84/ 1.36); IV 9.97 (2.60/ 0.91/ 2.12/ 2.76/ 1.58). Leg formula 4123. ***Legs spination.*** Femora: I d1-1, p0-0-1; II d1-1, p0-0-2; III–IV d1-1-1, p0-1-1, r0-0-1; tibiae: I v4-4-4; II v4-4, p1; III–IV d0-0-1, p1-0-1, r1-0-1, v2-2-2; metatarsi: I–II v2-2; III–IV p1-1, r1-1, v2-2-2. ***Male Palp.*** Tibia heavily sclerotized, conoid, wider than long, its length about two thirds the cymbium length, with a rounded, prolateral apophysis (PTA) conspicuous, distally oriented, RTA bilobed, with a massive, subtriangular, median lobe (ML) projected retrodistally, concave on its inner face, and with a smaller ventral lobe (VL) with conical base, its retrolateral face membranous, where arises a long, straight, thin apical spur (AS) pointing ventrodistally, its tip slightly sinuous (Figs 5–7). Cymbium (Cb) about twice as long as wide, with a heavily sclerotized, wide, squared, prolateral basal process, having a shallow grove facing the PTA (Figs 5–6, 8–9); with a massive, heavily sclerotized cymbial retrolateral basal process (CRP) much extended proximally, opposite to ML, subquadrate, somewhat ear-like in ventral view (Figs 6, 7, 9), its dorsal face convex, its ventral face concave (Figs 6, 9). Bulb structures heavily sclerotized, subtegulum (ST) long, partially visible on prolateral view (Figs 5, 8), completely visible in the expanded bulb (Figs 11–16), in which is also visible the petiole (Pe), as a slightly sclerotized rectangular plate at the dorsal part of alveolus, united to the basal hematodocha (Fig. 12, 15). The spermophore (Sp) occupies the basal half of bulb; tegulum (T) convex, occupying almost all width of alveolus, narrowed on its proximal margin (Figs 5–10), prolonged distally as a prolateral, laminar tegular process (TP), longer than wide, subrectangular, slightly convex, with a longitudinal, lighter, less sclerotized stripe (TPlss), its distal prolateral corner rounded, its distal retrolateral corner pointed, its retrolateral margin (next to the less sclerotized stripe) hidden by the ventral process of the embolar base (VPE) (Figs 5, 6, 8, 9); embolar base (EB) rounded, heavily sclerotized, arising on the dorsal, distal tegulum, in ventral view hidden by the tegular process, in prolateral view between subtegulum and tegular process (Figs 5, 8); embolus (E) starting

Figures 21–23. Live specimens of *Falconina cafetera* sp. nov. **21.** Pair of *Falconina cafetera* sp. nov. collected to be used in feeding trials, showing color pattern of living specimens; **22, 23.** Male and female living specimens of *Falconina cafetera* sp. nov. each feeding on an *Azteca sericeasur* ant; **22.** Male; **23.** Female.

on the ventral side of EB, spine-like, angled at mid length (Figs 7, 10, 11–16), embolar base with two processes beyond embolus, a short, blunt retrolateral process (RPE) (Figs 6, 7, 9, 10, 12, 13, 15, 16), and a greatly developed U-shaped ventral process (VPE) issuing from EB, proximally directed, overlapping the distal-retrolateral area of the tegulum, then making an U-twist (Figs 7, 10, 13, 16), widening to form a heavily sclerotized, convex, subtriangular plate distally oriented, adjacent and overlapping the retrolateral margin of TP, in ventral view hiding the E and part of the EB (Figs 5–16); conductor (C) membranous, slender, sinuous, arising from the distal, retrolateral corner of T, flattened and slightly widened distally, ending in front of embolus tip (Figs 6, 7, 9, 10, 13, 16).

Female (allotype). Color pattern as in male, except palpal tibia, tarsus brown, tip of tarsi light brown; opisthosoma without dorsal scutum, posterior thick transversal black band with two middle, orange (light yellow in ethanol), threadlike chevrons (Figs 3–4). ***Measurements.*** Total length 5.32; carapace length 2.40, width 1.90, sternum length 1.27, width 1.20; opisthosoma length 2.92, width 2.20. Anterior eye row width 0.68, posterior eye row width 0.78; median ocular quadrangle length 0.34, anterior width 0.36, posterior width 0.38; clypeus height 0.18. ***Legs measurements.*** I total 6.20+ (2.10/ 0.84/ 1.80/ 1.46/ lacking); II 7.03 (1.98/ 0.78/ 1.61/ 1.40/ 1.26); III 6.45 (1.80/ 0.61/ 1.43/ 1.65/ 0.96); IV 8.74 (2.28/ 0.79/ 1.91/ 2.44/ 1.32). ***Leg spination.*** As in male, except femora: II d1-1, p0-0-1; IV d1-1-1, p1-0-1, r0-0-1; tibiae: II v4-4, p2; IV p1-0-1, r1-0-1, v2-2-2; metatarsus: III p1-1-1, r1-1-1, v2-2-1r. ***Female genitalia.*** Epigynum heavily sclerotized, wider than long, maximum width at posterior half; anterior plate (AEP) occupying about nine-tenths of epigynum length, posterior margin (PmEP) procurved, close to posterior margin of posterior vulvar plate (PVP), with a median, small, copulatory opening (CO) partially covered by a shallow hood (Figs 17, 19); with posterior margin of PVP almost straight, slightly projected over epigastric furrow, occupying about four-fifths of epigynum width (Figs 17, 19); dorsally, vulva with a wider than long, subrectangular PVP occupying the posterior two-fifths of epigynum, having anterolateral sclerotized extensions (ExPVP) joined to primary spermathecae (S1) (Figs 18, 20); copulatory ducts (CD) visible in the cleared epigynum, long, slender, widening distally, ducts inside heavily sclerotized wide chambers, about half as long as epigynum, almost contiguous, ending at about one-tenth of anterior epigynum margin, where emerges on each, an anteriorly, small, globular secondary spermatheca (S2), separated one from the other by about five diameters, followed posteriorly by an elliptic, disk-like S1, just lateral and closely joined to the anterior end of each wide chamber, separated one from the other by about three diameters, its width about two diameters that of S2; fertilization duct (FD) short, arc-shaped, sclerotized, originating on the posterior margin of each S1, lateral to the point where extensions of PVP join to S1 (Figs 18, 20).

Variation. ***Males*** (n = 7): total body length 4.88–6.60; carapace length 2.42–3.00; carapace width 2.08–2.38; leg I: femur 2.30–2.63, patella 0.90–1.06, tibia 2.05–2.44, metatarsus 1.78–1.97, tarsus 1.49–1.90; leg IV: femur 2.48–2.78, patella 0.85–1.03, tibia 2.02–2.28, metatarsus 2.65–3.04, tarsus 1.49–1.70. ***Females*** (n = 3): total body length 5.22–5.76; carapace length 2.30–2.44; carapace width 1.77–1.96; leg I: femur 1.95–2.10, patella 0.71–0.84, tibia 1.67–1.80, metatarsus 1.37–1.46, tarsus 1.24–1.25; leg IV: femur 1.96–2.28, patella 0.72–0.79, tibia 1.64–1.91, metatarsus 2.20–2.44, tarsus 1.21–1.32.

Distribution. Known only from the collection localities in Chiapas, México. This is the first record for a *Falconina* species in Mexico and the northernmost native species of this genus in continental America.

Field observations and rearing trials. In the coffee plantations, specimens of *F. cafetera* sp. nov. were observed wandering in tree trunks with *Azteca sericeasur* Longino, 2007 (Formicidae: Dolichoderinae) nests (at heights between 1 and 1.6 m above the ground) or in the soil leaf litter accumulated at the base of those trees, but rarely far away from trees with ant nests. In order to corroborate that *F. cafetera* sp. nov. lives in close proximity with *A. sericeasur* ants, nests of these ants were disturbed by stirring a fine stick into them. After the disturbance, ac-

tive *F. cafetera* sp. nov. spiders were observed coming out of the nests along with some excited ants; however, when ants were very close to spiders, these tended to evade them. In order to test whether *F. cafetera* sp. nov. consumed *A. sericeasur* individuals, feeding trials were carried out at Finca Irlanda. For these trials, 18 spiders were captured alive (Fig. 21), and each spider was put into a 1-liter plastic container with approximately 25 *A. sericeasur* ants. After 24 hours, we found 11 ants dead, and two spiders were observed with an ant on their chelicerae (Fig. 22–23). However, we do not know if the spiders preyed on alive, healthy ants or consumed dead or injured ants. Additionally, six juvenile spiders were collected alive and reared at the Colección de Arácnidos del Sureste de México (32 km away from the coffee plantations, without the availability of *Azteca* ants). These juveniles were offered two types of prey. For the first two weeks, each juvenile received two *Camponotus* sp. Mayr, 1861 ants (Formicidae: Formicinae). Every two days, the spiders accepted the *Camponotus* ants as prey. Later, in lack of ants, one *Anastrepha* sp. Schiner, 1868 fruit fly (Diptera, Tephritidae) was offered to each of these juveniles every three days; all flies were accepted as prey. All laboratory-reared individuals (except one that escaped its cage) reached adulthood.

Proposed addition to the key to the species of *Falconina* by García and Bonaldo (2023)

1A Opisthosoma mostly dark in color with some light patches 1
– Opisthosoma mostly light in color with some dark patches (Figs 1–4, 21) .... *Falconina cafetera* sp. nov.

Discussion

The previously known species of *Falconina* were found only in South and Central America, with one species introduced in the USA and Cuba (Valle et al. 2013; Ubick and Richman 2017; García and Bonaldo 2023). *Falconina cafetera* sp. nov. is the first species of this genus from Mexico and extends the natural distribution of the genus *Falconina* to North America. *Falconina cafetera* sp. nov. is one additional example of spider genera that were previously found only in South America and are now found in Chiapas, Mexico, as is the case of the genera *Josa* (Ibarra-Núñez et al. 2011), *Taczanowskia* (Ibarra-Núñez 2013), and *Wirada* (Campuzano and Ibarra-Núñez 2018).

This is the first *Falconina* species in which the ventral process of the embolar base (VPE) has been observed. This is an unusual sclerite; no record has been made for other species in this genus, nor seemingly for any other species of the subfamily Corinninae. In this subfamily, the bulb structures are usually strongly sclerotized (except the conductor), which makes it difficult to study them with an optical microscope since the boundaries between sclerites are difficult to discern. However, the observation of a recently molted adult male of *Falconina cafetera* sp. nov., with the bulb structures slightly sclerotized (Figs 8–10), and the expansion of the bulb in other specimens (Figs 11–16) facilitated the observation of the VPE as a sclerite developed from the embolar base, not as a bifurcation of the tegular process. In *Falconina cafetera* sp. nov., there are two structures issued from the embolar base: 1) the retrolateral process of the embolar base (RPE), corresponding to the "embolar process, developed retrolaterally" of García and Bonaldo (2023, page 203), and 2) the greatly developed VPE. In ventral view, the VPE shows a rounded proximal, prolateral edge, where it overlaps the TP. This seems to be indicative of the U-shaped fold of this sclerite. This same rounded edge seems to be present in the palps of some other *Falconina* species, as figured in *F. adriki* (fig. 15A in García and Bonaldo 2023), *F. albomaculosa* (fig. 13A in García and Bonaldo 2023), and *F. melloi* (figs 6–7 in Müller and Heimer 1988; fig. 211 in Bonaldo 2000; fig. 12B in García and Bonaldo 2023). It is possible that those species have a palp configuration like that of *F. cafetera* sp. nov. concerning the presence of a VPE, but which until now has not been observed due to intense sclerotization and tight overlap of VPE over TP. Submitting the palp of those species to expansion or examination at the scanning electronic microscope can help to clarify this issue.

Among the *Falconina* species, only *F. gracilis* has been previously observed having interactions with ants (Fowler 1984; Ubick and Richman 2017; García and Bonaldo 2023). Cushing (1997, 2012) defined three types of associations between spiders and ants: myrmecomorphy (mimicry), myrmecophily, and myrmecophagy. Myrmecomorph spiders have a modified body and/or color pattern that "gives the illusion that the spider has more than two body parts" and a way of moving that mimics that of ants. In addition, myrmecomorph spiders are normally active during the day, like the ants they mimic (Cushing 2012). *Falconina gracilis* (cited as its junior synonym *Corina vertebrata* Mello-Leitão, 1939) has been considered an apparent myrmecomorph of *Acromyrmex landolti* (Forel, 1885) (Myrmicinae) because the "spider resembled the worker ant, both in size and form" (Fowler 1984). The bright orange hue of the opisthosoma of live *F. cafetera* sp. nov. individuals (Fig. 21) is like that of the abdomen of *Azteca sericeasur* ants, but the shape and size of the spiders (being clearly bigger than the ants, Figs 22, 23) are not visually close to those of these ants, indicating the spider does not have the characteristics of a myrmecomorph (Cushing 2012).

Myrmecophile spiders have adaptations to live alongside the ants or within the ant colonies, such as a small size, chemical mimicry, and mechanisms to mislead or appease the ant hosts (Cushing 2012). *Falconina gracilis*

individuals have been observed entering and leaving nests of *Acromyrmex landolti* (Fowler 1984) and *Atta* spp. (Myrmicinae) (García and Bonaldo 2023). Fowler (1984) observed that "when touched by an ant in the foraging column, the spider momentarily accelerates…" indicating a refusal to be contacted by ants. Ubick and Richman (2017) cite that *F. gracilis* has been associated with nests of *Solenopsis invicta* Buren, 1972 (Myrmicinae) in Texas, where both ant and spider are considered introduced species. However, Ubick and Richman did not mention the type of association that was observed between spiders and ants. Some *F. cafetera* sp. nov. individuals were observed coming out of ant nests. Nevertheless, individual spiders are about one-third to one-half longer than *Azteca sericeasur* workers (Figs 22, 23), and the observation of *F. cafetera* sp. nov. individuals evading contact with groups of *Azteca sericeasur* suggests that these spiders lack mechanisms to pass unnoticed when meeting ants, so it could not be a myrmecophile.

Contrary to most spiders, myrmecophage spiders can take ants as prey. Some species of myrmecophage spiders use several mechanisms to reduce or inhibit the aggression of ants (Cushing 2012). *Falconina gracilis* individuals have been observed preying on the ants *Acromyrmex landolti* (Fowler 1984) and *Atta* spp. (García and Bonaldo 2023). Individuals of *F. cafetera* sp. nov. were observed eating *Azteca sericeasur* and *Camponotus* sp. ants but also accepted non-ant prey in laboratory trials. The fact that practically all the laboratory-reared juveniles reached adulthood on a mixed diet of ants and dipterans suggests this spider is a generalist predator, but in contrast to many other spider species, *F. cafetera* sp. nov. can capture and eat ants. However, more studies are needed to elucidate accurately this spider´s relationships with ants.

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